Co-funded by the Horizon 2020 programme
of the European Union

ADVICE

advancing user acceptance of general purpose hybridized vehicles by **improved cost and efficiency**

- **Duration:** 36 months
- **Project Start:** 1st April 2017
- **Consortium:** 20 partners
- **Project Budget:** 12.7 Mio. Euro
- **Project Funding:** 10.0 Mio.

The Project **ADVICE**

ADVICE aims at increasing the numbers of HEVs and P-HEVs up to 10 % of all vehicles registered in the mid-term range. This will be achieved by focusing on a market segment called „premium class", which covers medium class over upper medium class up to luxury vehicles and to SUVs. This segment is facing severe problems in reaching the more and more severe European CO_2 targets, when running on fossil fuel only, not the least due to the considerable vehicle weight.

In ADVICE three physical demonstrator vehicles are built, ranging from mild-hybrid to full plug-in hybrid and – concerning fuel type – from gasoline to diesel-driven. In addition, it will be shown that the whole range in between these demonstrator vehicles can be well covered by means of validated simulation, yielding a complete coverage of the whole "premium class" segment.

Besides fulfilling the energy efficiency and emission requirements of the call and limiting premium cost to 5 % with respect to the best in-class non-hybrid diesel (and 15 % premium for a P-HEV), particular attention is devoted to optimum drivability and drive performance, which are essential when purchasing a "premium class" vehicle and thus crucial to achieve the market penetration aimed at. All these objectives will be accomplished by:

- **Architecture level hybrid powertrain solutions** suitable to be modularly applied to different segments to increase their volumes, thus reducing costs
- **Advanced (predictive) control strategies**, taking advantage of future knowledge from external media and model predictive control strategies, taking the whole vehicle into account (not only the hybrid part)
- **Novel optimised approaches in the aftertreatment-system**
- **High Temperature Electronics**, enabling novel strategies and approaches for energy- and thermal-management and
- **Multi-core processor architectures**, enabling sophisticated, computationally expensive control strategies and models processed on board of the vehicles.

In addition hybrid energy storage systems (a combination of differently sized electrochemical systems or mixed electrochemical and mechanical systems) will be used to demonstrate both, energy efficiency and cost reduction.

ADVICE overall targets at a glance

- **Objective 1:** Cost premium of 5 % for mild and full hybrid and 15 % for P-HEV compared to best in class non-hybrid diesel vehicles available on the market.
- **Objective 2:** Reduction of fuel consumption on WLTP cycle by 20 % and 25 % increase in electric driving range for P-HEV, respectively.
- **Objective 3:** Demonstrating the vehicles' noxious emissions RDE compliance with a 1.5 compliance factor.
- **Objective 4:** Improvement of vehicle performance according to proper performance index and the objective assessment of driveability.
- **Objective 5:** Verification and assessment along 3 vehicle classes and 3 hybrid vehicle architectures.

Ambition

ADVICE's overall concept and approach is divided into two different types of activities: 'horizontal' and 'vertical' lines. The **horizontal lines** (H1, H2 and H3) relate to transversal and collaborative activities that are keys for realizing synergies through the project and achieving more generic results. The **vertical lines** (V1, V2 and V3) relate to specific demonstrator vehicle development activities. Project management, dissemination, and exploitation are important support activities.

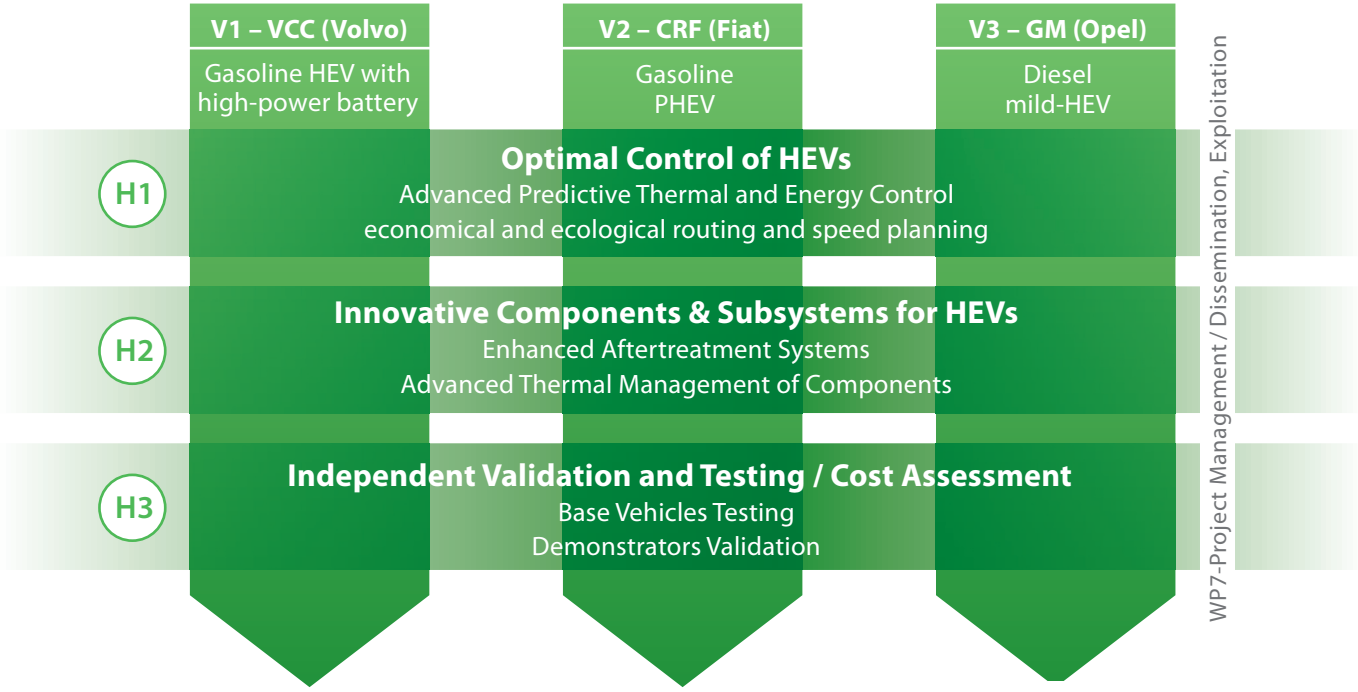
Horizontal line 1 (H1) **"Optimal Control of HEVs"** aims at improving the powertrain and associated systems efficiency by combining, sizing and defining advanced control strategies at an early design stage.

Horizontal line 2 (H2) focuses on the analysis of **innovative components for light duty HEV** and the set-up of an appropriate simulation environment.

Horizontal line 3 (H3) finally deals with the **independent validation and testing** of project results.

➨ **ADVICE will bring** technological solutions to a higher Technology Readiness Level (TRL). Therefore, following the project completion and thanks to the high TRL achieved, ADVICE results could have both a rapid industrial integration and subsequent market introduction and penetration.

Vertical line 1 to 3 (V1 to V3) represents the three vehicle demonstrator including the development results of the horizontal lines and of their own efforts.



Demonstrator 1

Demonstrator 2

Demonstrator 3

ADVICE

advancing user acceptance of general purpose
hybridized vehicles by improved cost and efficiency

Consortium Leader
Lars-Olof Carlsson
lars-olof.carlsson@volvocars.com
www.project-advice.eu

Consortium Deputy Leader
Dr. Bernhard Brandstätter
bernhard.brandstaetter@v2c2.at
www.project-advice.eu

Dissemination Manager
Dr. Michael Nöst
michael.noest@iesta.at
www.project-advice.eu

The Consortium